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The benthic invertebrates of the Salton Sea: distribution and seasonal dynamics.

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Abstract

The distribution and seasonal dynamics of the benthic macroinvertebrate populations in the Salton Sea were investigated during 1999 by bimonthly sampling of bottom sediments at depths of 2–12m, shallow water rocky substrates, and littoral barnacle shell substrates in the first survey of the invertebrate community since 1956. The macroinvertebrates of the Salton Sea include only a few species, most of which thrive on several different substrates. The principal infaunal organisms are the polychaetes *Neanthes succinea* and *Streblospio benedicti*, and the oligochaetes *Thalassodrilides gurwitschi*, *T. belli*, and an enchytraeid. All but *Neanthes* are new records for the Sea. Benthic crustacean species are *Gammarus mucronatus*, *Corophium louisianum*, and *Balanus amphitrite*.

The pileworm *Neanthes succinea* (Frey and Leuckart) is a key prey species for fish and birds, and is the dominant macroinvertebrate on the Sea bottom at depths of 2–12 m. Area-weighted estimates of standing stock of *N. succinea* in September and November 1999 were 2 orders of magnitude less than biomass estimated to be present in September and November 1956. During 1999, population abundance varied spatially and temporally.

Abundance declined greatly in offshore sediments at depths >2m during summer and fall, due to decreasing oxygen levels at the sediment surface. In contrast, *Neanthes* persisted year round on shoreline rocks, where densities of all invertebrate species and biomass of *Neanthes* increased from January to November. The rocky shoreline had the highest numbers of organisms per unit area. In that habitat maximum densities of *Neanthes* and the amphipods *Gammarus mucronatus* and *Corophium louisianum* exceeded previously reported values for those species from other locations. This demonstrates the high productivity of the Salton Sea, and the importance of the rocky shoreline habitat as a refuge for *Neanthes* and other food organisms for fish and birds during seasonal anoxia.

Introduction

The Salton Sea has great ecological importance within the Pacific Flyway for migratory and resident bird species due in part to the abundant invertebrate populations that serve as a food base for birds. Restoration objectives of the Salton Sea Reclamation Act of 1998 include maintaining habitat components for waterfowl as well as maintaining the present fishery. The infaunal polychaete *Neanthes succinea* is the most important benthic link between the detritus accumulating on the sediments and the higher trophic levels including predaceous fish and birds, and constitutes a major portion of the diet of adult bairdiella and juvenile orangemouth corvina between 30–60 mm (Quast, 1961; Whitney, 1961). Despite the importance of *Neanthes* in the trophic structure of the Salton Sea ecosystem, there have been few ecological studies on this species at the Salton Sea. The abundance and standing stock of *Neanthes* in sediments were last estimated in 1956 by Carpelan & Linsley (1961a), but shoreline habitats were not examined. More recent